

AD 709474

OCEANOGRAPHIC INSTITUTE OF WASHINGTON

MOORING IN BASALTIC ROCK

Sponsored by
Advanced Research Projects Agency
ARPA Order No. 1664

PROGRAM PLAN

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OPERATIONS SCHEDULE
FOR
PROJECT SEA USE III-C

(Operations at Cobb Seamount in the period 27 July - 6 August 1970)

July 1970

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PREFACE

This is Annex A-3 to the Operations Guide for Project SEA USE III. It provides detailed guidance for carrying out the field operations planned as Project SEA USE III-C, which is scheduled for the period 27 July - 6 August 1970. This Operations Schedule has been written to mesh with CCGD 13 Oceanographic OpOrder No. 1-71 which the Commander, 13th Coast Guard District has issued to cover the operations of USCGC CACTUS and the Adjutant General, Washington National Guard Op Order No. 1-70 covering operations of the Washington National Guard Ship FS-313, the ships on which these SEA USE field operations will be based. It has been agreed by the Commander, 13th Coast Guard District and the Adjutant General, Washington National Guard, that insofar as it enumerates the details of organization of the SEA USE Group and of SEA USE tasks, this OpsSked for Project SEA USE III-C will prevail. This project has been sponsored by Advanced Research Project Agency, ARPA Order No. 1664. The open ocean mooring and rock bolt failure test is supported by the Advanced Research Projects Agency of the Department of Defense and is monitored by the Office of Naval Research under Contract No. N00014-70-C-0385.

- O. Organization
 - a. Ships -
 - (1) USCGC CACTUS (WLB-270) - is a 270' buoy tender with a 40' well deck and 20-ton boom based at the U. S. Coast Guard Base, Astoria, Oregon. She carries six officers and 43 men; has 13,000 miles endurance at 10 knots; and carries Loran-A and a UQN-1 fathometer. (Tel. 503-235-1601).
 - (2) Washington NG FS-313 - is a 176', twin screw, diesel power, steel supply ship, containing two cargo hatches on the well deck forward of the bridge. The 313 has one 10-ton and four 5-ton cargo booms, and four electric cargo winches. Cruise radius is 4500 miles at a cruising speed of 12 knots, and the ship has berthing for a total of 32 personnel, including passengers, and carries Loran-A, Bludworth fathometer and radar.
- b. The SEA USE Group will include the following, assigned to ships as indicated:
 - (1) USCGC CACTUS
 - (1) Medical Officer - Dr. Leon Sealey
 - (2) Diving Supervisor - Spencer Campbell
 - (3) Assistant Liaison Officer - Jim Washburn
 - (4) Assistant Diving Supervisor - Roland White
 - (4) Diver - Vince Ranier
 - (5) Diver - John Ericson
 - (6) Diver - Wallace White
 - (7) Photography Diver -

| | | | |
|------|-------------------------|---|--|
| (8) | Diver/Engineer | - | Peter Jacoby |
| (9) | Diver/Engineer | - | Donald Dodds |
| (10) | Diver | - | Dick Baldwin |
| (11) | Diver | - | Leroy Lang |
| (12) | Student Diver | - | John Blaine |
| (13) | Student Diver | - | Gary Petersen |
| (2) | Washington NG FS-313 | | |
| (1) | SEA USE Liaison Officer | - | Captain Griffith C. Evans, Jr., USN (Ret.) |
| (2) | Chief Geologist | - | Dr. David Pavear |
| (3) | Chief Engineer | - | |
| | Ocean Systems, Inc. | - | Louis S. Brown, Jr. |
| (4) | OSI Diver | - | Al McCready |
| (5) | OSI Diver | - | Buddy Baer |
| (6) | OSI Tender | - | Larry Liles |
| (7) | OSI Tender | - | Carol Mallo |
| (8) | Chief Engineering Diver | - | Kenneth Dodds |
| (9) | Diver/Engineer | - | Ron Mellin |
| (10) | Rigging Advisor | - | Robert Thurman |
| (11) | Equipment Technician | - | Donald E. Hanberg |

1. Background

USCGC CACTUS has been made available by Commander, 13th Coast Guard District, and FS-313 had been made available by Adjutant General, Washington National Guard, for the period 27 July through 6 August, to support the field operations of Project SEA USE III-C, which are to be carried out by the SEA USE Group. These operations at Cobb Seamount include the works planned for SEA USE III-C in the Operations Guide for Project SEA USE III, 10 April 1970, and are supported by the

SEA USE III-C

Advanced Research Projects Agency of the Department of Defense and are monitored by the Office of Naval Research under Contract No. N00014-70-C-0385.

So far as is known, no other oceanographic operations are planned in the vicinity of Cobb in the period covered by SEA USE III-C.

2. Purpose

- a. These operations are planned to include drilling three core holes in the pinnacle to obtain sample cores; grouting in rock bolts in the core holes to serve as moors, and testing one rock bolt to failure; laying a chain line axis along the site for the core holes for quick diver location; collecting rock samples (from any rock broken loose in coring or testing the one rock bolt); conducting extensive photography of all underwater operations; obtaining TV visual tape of coring and failure test, and updating the site survey data, particularly in the northwest quadrant, the latter as opportunity permits.
- b. Specific SEA USE tasks to be performed include the following, listed in general chronological order:

| Task No. | Task Title |
|----------|---|
| 35.01 | Implant clump in northwest quadrant and rig mooring buoys to new clump and existing clump in southeast quadrant for temporary, open ocean buoy moors. |
| 24.12 | Lay chain axis between clumps for quick diver, bottom orientation and location. |
| 34.01 | Core drilling. |
| 35.02 | Rockbolt emplacement. |
| 35.03 | Fail-test rock bolt. |

SEA USE III-C

| Task No. | Task Title |
|-----------------|---|
| 24.13 | Underwater photography. |
| 24.14 | Underwater TV visual tape recording. |
| 24.12 | Hydrographic survey (if feasible, locate and collect rock samples). |
| 24.12 | Hydrographic survey (mark drill sites so that cores may be oriented). |
| 24.12 | Hydrographic survey (update bathymetry of northeast quadrant). |
| 51. | Diving operations. |

3. Project Schedule

a. Core drilling and rock bolt implant training.

- (1) USS TATNUCK (ATA-195) departs Seattle 22 June 70 to arrive at first light at a reef running north from BARE rock, north of Orcas Island. Chief technician, two divers and two tenders with equipment from Ocean Systems, Inc., and two diving engineers from Foundation Sciences, Inc., with associated equipment, embarked. Training program will consist of drilling several cores along the reef and grouting in one or two rock bolts, with associated assembly. Additionally, Foundation Sciences, Inc. personnel will check rig for failure test in order to assure proper alignment design. Operations are scheduled to be completed by 1500, 25 June 1970.

b. Aquanaut training.

- (1) Qualification testing and physical exams for new participating members of SEA USE diving team. O₂ and N₂ tolerance tests and decompression station training for open sea

SEA USE III-C

diving operations at Cobb Seamount. Test will take place at training sites in the Seattle area in times of convenience for team members. The bulk of orientation and training to be carried out July 18-23 with open water testing of diver equipment and techniques to be used on SEA USE III-C. SEA USE diving support group conducted a successful orientation to coring equipment at Sucra Island June 22 - 24 in support of OSI diving team.

c. Operations at Cobb Seamount.

(1) General - The primary mission for Project SEA USE III-C is to obtain three, 5' x 2 $\frac{1}{2}$ " cores, grouting in rock bolts with their associated assembly in each core hole, two of which will be left as permanent moors and one of which will be tested to failure. In addition to these specific operations, it is imperative that an adequate visual record be maintained, both through photography and underwater TV tapes. Additionally, all data should be carefully recorded by hand, in order that adequate ocean engineering information from this operation be preserved for future analysis. Other tasks have been incorporated with the operation in order to obtain maximum efficiency.

(2) Chronological schedule (See Annex I)

F 24 Jul 70 - Load and prepare equipment on board USCGC CACTUS at Astoria.

M 27 Jul 70 - 0800 - CACTUS departs Astoria. Load and prepare equipment on board FS-313 at Pier 91, Seattle. 2000 - FS-313 departs Pier 91.

T 28 Jul 70 - 1200 approx. - CACTUS arrives Cobb. Commences operations to prepare pinnacle for buoy-type open ocean mooring.

W 29 Jul 70 - CACTUS completes buoy moors by sundown. FS-313 en route Cobb.

T 30 Jul 70 - FS-313 arrives at Cobb approx. first light and moors in position to drill two core holes in northwest quadrant.

SEA USE III-C

- F 31 Jul 70 - FS-313 drills two core holes and begins rock bolt emplacement; conducts dives of opportunity and support of coring operations, photography, and as opportunity permits, acoustic-optical scattering experiment, and rock samples. CACTUS remains in vicinity and conducts such operations as may be safely assigned.
- S 1 Aug 70 - FS-313 shifts berth to southeast quadrant on moors. CACTUS commences rock bolt failure test, photography and dives of opportunity as may be safely conducted.
- S 2 Aug 70 - FS-313 drills third core and emplaces third rock bolt and assembly. CACTUS continues photography dives and dives of opportunity as may be safely conducted.
- M 3 Aug 70 - FS-313 departs Cobb, en route Pier 91. CACTUS continues rock bolt test and dives of opportunity.
- T 4 Aug 70 - Approx. 1800 - FS-313 arrives Pier 91 and disembarks personnel and equipment. CACTUS completes rock bolt failure test and dives of opportunity.
- W 5 Aug 70 - Approx. 1600 CACTUS departs Cobb Seamount for Astoria.
- T 6 Aug 70 - CACTUS arrives Astoria approx. 1000 and disembarks personnel and equipment.

d. Communications.

USCGC CACTUS is equipped with URC-51. WNG FS-313 is equipped with SCR-8. Primary ship-to-ship voice communications will be on 2670 KHz. Secondary voice frequency will be 2638 KHz. Visual signal will be by signal light. Flag signals will be in accordance with

SEA USE III-C

HO-102 to the extent each ship is capable. Both ships will maintain such other radio watches as may be required by their parent command.

4. Project support

a. Personnel

(1) Personnel participating in SEA USE III-C do so at their own (or their parent organization's) risk and expense. Subsistence of supporting personnel will be funded by the DCW.

(2) Personal equipment required includes:

- (a) Complete diving equipment required for all divers to be supplied by the individuals. (Details to be worked out with Diving Committee).
- (b) Necessary clothing and personal effects to sustain 14 days at sea.

b. Equipment and materials to be provided include:

| | Weight (lbs) |
|---|--------------|
| (1) Aboard CACTUS | |
| (a) Recompression chamber (NDI) | 4500 |
| (b) Portable hydrophone and receiver unit (Honeywell) (1) | 300 |
| (c) Portable HP compressor (1) | 1000 |
| (d) Air filter (LP) (1) | 50 |
| (e) Zodiac Boats (2) | 500 |

| | Weight (lbs) | |
|---|--------------|--|
| (i) 3rd Class can buoy (with anchor weight) (Coast Guard) | CG | |
| (g) Medical kits | 100 | |
| (h) Air cylinders and manifold (12) | 1200 | |
| (i) Oxygen cylinders 220 cu/ft (6) | 600 | |
| (j) Gasoline drums - (1) 50 gal barrels | 400 | |
| (k) Outboard Motor (2) | 300 | |
| (l) Underwater Cameras - OIW | 50 | |
| (m) Underwater television system (3 boxes) Honeywell | 400 | |
| (2) Aboard FS-313 | | |
| (a) OSI core drilling rig and hydraulic drive | 3500 | |
| (b) LP air compressor for jack hammer (NG) | 1500 | |
| (c) Foundation Science Inc. pulling stand and hydraulic ram | 2000 | |
| (d) Foundation Sciences Platform float, 8' x 11' x 3' | 1000 | |
| (e) 500' - 5/8" wire for cargo boom (OSI) | 250 | |
| (f) 700' - 4" hawser for stern moor (OSI) | 550 | |
| (g) Portable oxy-acetylene welding gear (NG) | 200 | |
| (h) Portable recompression chamber (OSI) | 4500 | |

- c. Transportation required includes:
 - (1) Personnel - Car transportation arrangements to be handled by SEA USE Management Center.
 - (2) Equipment - from Seattle - Trucking to be handled by Mr. John Dermody, UW. Pick-up arrangements through SEA USE Management Center.
- 5. Control
 - a. The CO, CACTUS and CO, FS-313 are in command of all personnel embarked and operations based on their ship, and must approve each operation with due regard for safety.
 - b. Under the CO, the officers and crew of CACTUS and FS-313 are prepared to assist in loading and securing equipment for sea and related deck seamanship tasks incident to the operations and otherwise to participate in the SEA USE tasks, though not to interfere with the regular ship's work and at the discretion of the CO.
 - c. In case of a major disaster or national emergency, SEA USE III-C will be aborted; CACTUS and FS-313 will proceed where directed by CDR, 13CGD and by Adj. Gen Wash NC.
 - d. The SEA USE Liaison Officer is in overall charge of the SEA USE Group. In his absence, the Assistant Liaison Officer will assume this responsibility. Subject to the concurrence of the CO, CACTUS and FS-313 he will adjust the task priorities as conditions require.
 - e. The Diving Supervisor is in direct charge of the Diving Team and, under the ship CO and the SEA USE Liaison Officer and subject to the concurrence of the Medical Officer, will control all diving operations.
 - f. General direction and management of Project SEA USE III-C (ashore) will be exercised by the SEA USE Management Center, Honeywell Building, 5303 Shilshole Ave., N. W., Seattle 98107 (206-SU 9-2000, X-497).

SEA USE III-C

- g. All public relations are to be handled by the SEA USE Management Center through the Oceanographic Institute of Washington. A press conference in Seattle is scheduled for 1430, Thursday, 23 July 1970 at 312 First Avenue North, with appropriate releases.
- h. On completion of the operations, SEA USE is to furnish CDR, 13 CGD with:
 - (1) General description of the project, results obtained or expected, and a statement that SEA USE will publish and provide a final report (for Commandant, U. S. Coast Guard).
 - (2) The same as (1) above plus data sheets (for National Oceanographic Data Center, Washington, D. C.).
- i. Similar information will be furnished Adj Gen Wash NG.
- j. At an early date after the operation, the SEA USE Group will meet to discuss accomplishments and plan the drafting of a report. It is expected that the component parts of the report will be ready for final editing by 20 Oct 70 so that the smooth report can be published by 10 Nov 70.

For the SEA USE Council,

E. D. STANLEY JR.
Manager, SEA USE Program